

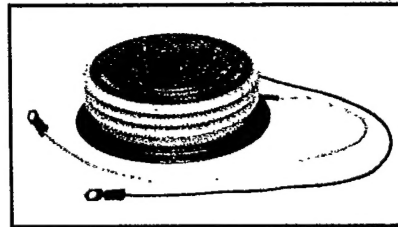
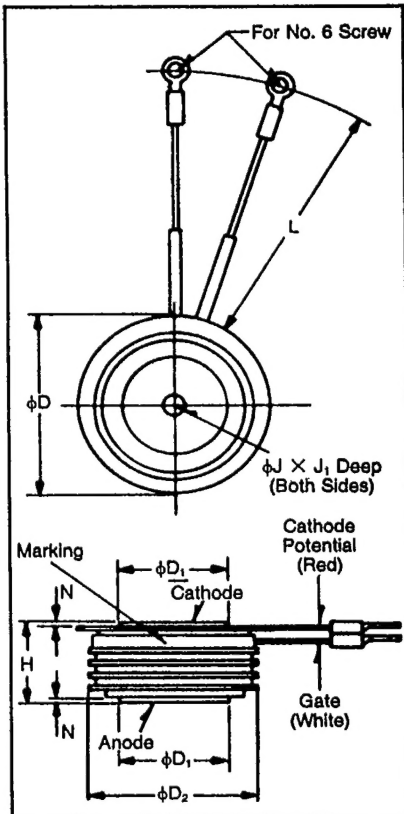


TA20

Powerex, Inc. Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

Phase Control SCR 1600-1800 Amperes Avg 100-2200 Volts



TA20
Phase Control SCR
1600-1800 Amperes/100-2200 Volts

Description

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) devices employing the field-proven amplifying (di/namic) gate.

Features:

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I²t Ratings

Applications:

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

Ordering Information

Example: Select the complete eight digit part number you desire from the table - i.e. TA200816 is a 800 Volt, 1600 Ampere Phase Control SCR.

TA20
Outline Drawing

| Dimensions | Inches | | Millimeters | |
|-----------------|--------|-------|-------------|--------|
| | Min. | Max. | Min. | Max. |
| ϕD | 3.910 | 3.950 | 99.31 | 100.33 |
| ϕD ₁ | 2.470 | 2.480 | 62.74 | 63.00 |
| ϕD ₂ | 3.440 | 3.560 | 87.38 | 90.42 |
| H | 1.260 | 1.300 | 32.00 | 33.02 |
| ϕJ | .135 | .145 | 3.43 | 3.68 |
| J ₁ | .075 | .090 | 1.91 | 2.29 |
| L | 11.50 | 12.50 | 292.10 | 317.50 |
| N | .050 | — | 1.27 | — |

Creep Distance—1.40 in. min. (35.56 mm)
Strike Distance—.98 in. min. (24.89 mm).
(In accordance with NEMA standards.)
Finish—Nickel Plate.
Approx. Weight—2.1 lb. (950 g).

1. Dimension "H" is a clamped dimension.

| Type | Voltage* | | Current | |
|------|--------------------------------------|------|----------------------|------|
| | V _{ORM} V _{RRM} | Code | I _T (avg) | Code |
| TA20 | 100 | 01 | 1600 | 16 |
| | 200 | 02 | 1800 | 18 |
| | 400 | 04 | | |
| | 600 | 06 | | |
| | 800 | 08 | | |
| | 1000 | 10 | | |
| | 1200 | 12 | | |
| | 1400 | 14 | | |
| | 1600 | 16 | | |
| | 1800 | 18 | | |
| | 2000 | 20 | | |
| | 2200 | 22 | | |

* All voltages not available in all current ratings.



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Absolute Maximum Ratings

| | Symbol | TA20 - 16 | TA20 - 18 | Units |
|---|--------------------|--------------------|--------------------|--------------------|
| Maximum Blocking Voltage | V_{DRM}, V_{RRM} | 2200 | 1800 | Volts |
| RMS On-State Current | $I_{T(RMS)}$ | 2500 | 2820 | Amperes |
| Average On-State Current | $I_{T(av)}$ | 1600 | 1800 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz) ^① | I_{TSM} | 29,500 | 40,000 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) ^① | I_{TSM} | 26,900 | 36,500 | Amperes |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive) ^{② ③ ④} | di/dt | 400 | 400 | Amperes/ μ s |
| Critical Rate-of-Rise of On-State Current (Repetitive) | di/dt | 150 | 150 | Amperes/ μ s |
| I^2t (for Fusing), One Cycle at 60 Hz | I^2t | 3.63×10^6 | 6.67×10^6 | A ² sec |
| Peak Gate Power Dissipation | P_{GM} | 16 | 16 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 3 | 3 | Watts |
| Storage Temperature | T_{STG} | -40 to 150 | -40 to 150 | °C |
| Operating Temperature | T_J | -40 to 125 | -40 to 125 | °C |
| Mounting Force ^⑤ | | 9000 to 11,000 | 9000 to 11,000 | lb. |
| Mounting Force ^⑤ | | 4100 to 5000 | 4100 to 5000 | kg |

Electrical and Thermal Characteristics

| | Symbol | Test Conditions | TA20 - 16 | TA20 - 18 | Units |
|--|-----------------|--|-----------|-----------|--------------------|
| Current—Conducting State Maximums | | | | | |
| Peak On-State Voltage | V_{TM} | $I_{TM} = 3000A, T_J = 25^\circ C$ | 1.75 | 1.45 | Volts |
| Voltage—Blocking State Maximums^① | | | | | |
| Forward Leakage, Peak | I_{DRM} | $T_J = 125^\circ C, V_{DRM} = \text{rated}$ | 100 | | mA |
| Reverse Leakage, Peak | I_{RRM} | $T_J = 125^\circ C, V_{RRM} = \text{rated}$ | 100 | | mA |
| Switching | | | | | |
| Typical Turn-Off Time | t_q | $I_T = 250A, T_J = 125^\circ C,$ $di_R/dt = 50A/\mu\text{sec}, \text{reapplied}$ $dv/dt = 20V/\mu\text{sec linear to } 0.8V_{DRM}$ | 250 | | μsec |
| Typical Turn-On Time ^② | t_{on} | $I_{TM} = 1000A, V_D = 1500V$ | 4.0 | | μsec |
| Min. Critical dv/dt exponential to V_{DRM} ^{③ ④} | dv/dt | $T_J = 125^\circ C$ | 300 | | V/ μsec |
| Thermal | | | | | |
| Maximum Thermal Resistance, ^⑤ double sided cooling Junction to Case | $R_{\theta JC}$ | | .015 | | °C/Watt |
| Case to Sink, Lubricated | $R_{\theta CS}$ | | .007 | | °C/Watt |
| Gate—Maximum Parameters | | | | | |
| Gate Current to Trigger | I_{GT} | $T_J = 25^\circ C, V_D = 12V$ | 200 | | mA |
| Gate Voltage to Trigger | V_{GT} | $T_J = 25^\circ C, V_D = 12V$ | 3.0 | | Volts |
| Non-Triggering Gate Voltage | V_{GDM} | $T_J = 125^\circ C, \text{rated } V_{DRM}$ | .15 | | Volts |
| Peak Forward Gate Current | I_{GTM} | | 4 | | Amperes |
| Peak Reverse Gate Voltage | V_{GRM} | | 5 | | Volts |

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher dv/dt ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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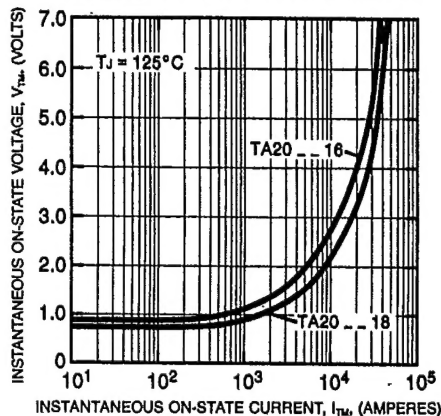
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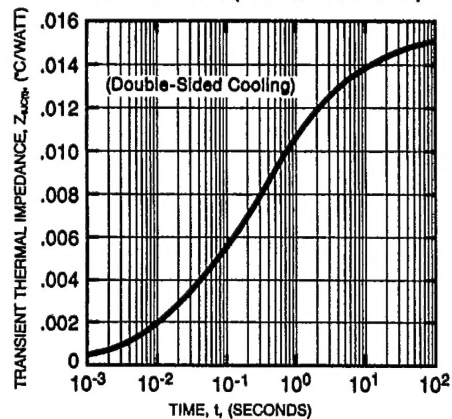
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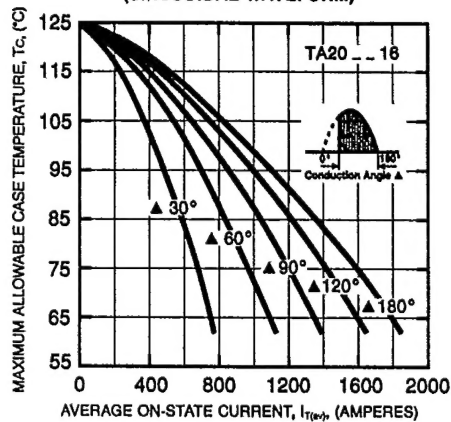
MAXIMUM ON-STATE CHARACTERISTICS



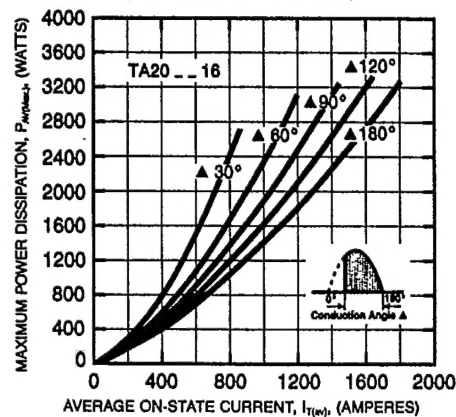
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



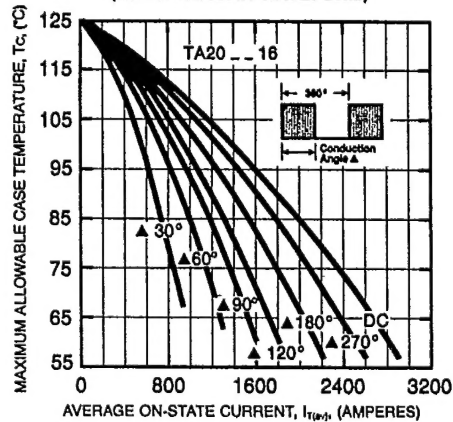
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



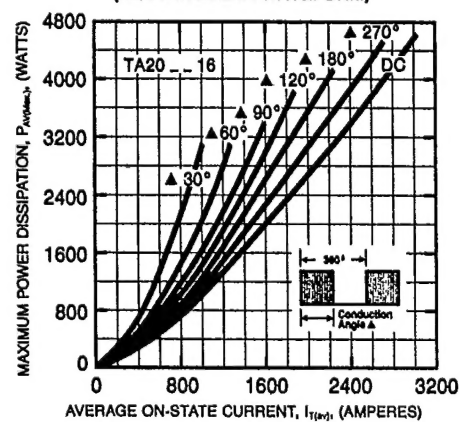
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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